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MAX-PLANCK-GESELLSCHAFT ZUR

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CLAIMS

> We Claim

1. Interactive system comprising at least one active surface of a plastic material from monomers containing at least one structural element (A) derived from a carboxylic acid and at least one substance coupled to a linker with at least one structural element (B) capable of establishing a hydrogen bond, the interaction taking place between the structural elements (A) and (B).
2. Interactive system according to claim 1, wherein the structural element derived from a carboxylic acid is located in a side chain of the monomer.
3. Interactive system according to claim 1 or 2, wherein the plastic material is a plastic material from a polymethacrylate, a polyvinylester or a copolymer, or a mixture thereof with other polymerizable substances.
4. Interactive system according to ~~any of claims 1 to 3~~ ^{claim 1}, wherein the linker is selected from (poly)alkylene glycols, (poly)alkylene imines, (poly)alkylene amines and (poly)alkylene sulfides.
5. Interactive system according to ~~any of claims 1 to 4~~ ^{claim 1}, wherein the active surface is a membrane, a porous or solid microparticle, a magnetic microparticle, a filter mat, a fibrous material, a spun material or a combination thereof, or a coating made from a natural or synthetic substance.
6. Interactive system according to ~~any of claims 1 to 5~~ ^{claim 1}, wherein the system is present in the form of a capillary tube system, a filter for physiological liquids, a dialyzer, a physiological replacement fluid, an enzyme delivery system, an arthroplasty or vascular prosthesis, or an artificial organ.
7. Interactive system according to ~~any of claims 1 to 6~~ ^{claim 1}, wherein the coupled substance is a physiologically and/or pharmacologically active substance.

8. Interactive system according to claim 7, wherein the active substance is a protein, a nucleic acid, a cellular signal substance, a partner of a biological or physiological affinity pair, a synthetic Ni-NTA complex, a synthetically produced pharmacon or a synthetically produced active ingredient or a marker for a biological or synthetic substance.
9. Interactive system according to claim 8, wherein the protein is selected from enzymes, antigens, antibodies, tumor markers, surface antigens, ligands, receptors, surface-active cell fragments of bacteria or viruses or immune messenger substances.
10. Interactive system according to claim 8, wherein the marker is a fluorescent or chemiluminescent substance, an EST (expression sequence code) or an enzyme.
11. Interactive system according to claim 7, wherein the active substance is an anticoagulant, a metabolically active enzyme, an antibiotic or a synthetic pharmacon.
12. Interactive system according to ^{claim 1} ~~any of claims 1 to 11~~, wherein the plastic material is poly(meth)acrylate or a poly(meth)acrylate copolymer, the linker is polyethylene glycol and the coupled substance is an anticoagulant selected from heparin, hirudin, directly acting antithrombins or prothrombin.
13. Interactive system according to ^{claim 1} ~~any of claims 1 to 11~~, wherein the plastic material is poly(meth)acrylate or a poly(meth)acrylate copolymer, the linker is polyethylene glycol and the coupled substance is an enzyme or a pharmaceutical composition.
14. Composition comprising an interactive system according to ^{claim 1} ~~any of claims 1 to 13~~.
15. Composition according to claim 14 in the form of food, preferably a dietary food or designer food.
16. Composition according to claim 14 in the form of a pharmaceutical composition.

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- a 17. Use of an interactive system according to ~~any of claims 1 to 14~~ as a system for presenting substances coupled to the linker in a liquid, wherein the target substance is bound, cleaved or otherwise modified by the coupled substance.
- a 18. Use of an interactive system according to ~~any of claims 1 to 14~~ ^{claim 1} for removing a substance coupled to the linker from a liquid.
- a 19. Use according to claim 17 ~~or 18~~, wherein the liquid is a biological liquid selected from whole blood, plasma, serum, urine, lymph, liquor, organ bioplate, enteral contents or sperm.
- a 20. Use according to claim 17 ~~or 18~~, wherein the liquid is food or a food component.
- a 21. Use according to ~~any of claims 17 to 19~~ ^{claim 17} as an extracorporeal therapeutic or diagnostic system.
22. Use according to claim 21 for the diagnosis and therapy of metabolic diseases, coagulation defects, viral, bacterial, mycotic or parasitic infections or malignant diseases.
23. Use according to claim 20 for the manufacture of dietary food or designer food.
- a 24. Use of an interactive system according to ~~any of claims 1 to 13~~ ^{claim 1} for the production of assay systems.
25. Use according to claim 24 for the production of affinity columns, microtiter plates, ELISA test plates, microsticks, diagnostic sticks, hollow fibers or sheet materials.
- a 26. Device comprising an interactive system according to ~~any of claims 1 to 13~~ ^{claim 1} in a suitable housing, optionally together with an apparatus for operating the device.

- a 27. Kit comprising an interactive system according to ^{claim 1} ~~any of claims 1 to 18~~, optionally together with suitable reagents, buffer solutions and reaction vessels and optionally in a suitable packaging.
- a 28. Method for treating a liquid, characterized in that the liquid to be treated is brought into contact with an interactive system according to ^{claim 1} ~~any of claims 1 to 18~~ and that afterwards the thus treated liquid is separated again.
29. Method according to claim 28, characterized in that the liquid to be treated is blood, a blood component or a secondary blood product and that the interactive system comprises a substance reacting with a blood component.
30. Method according to claim 28, characterized in that the liquid to be treated is food and that the interactive system comprises a substance reacting with a food ingredient.
- a 31. Interactive system according to ^{claim 1} ~~any of claims 1 to 18~~ for the use as an agent for the treatment of metabolic diseases, coagulation defects, viral, bacterial, mycotic or parasitic infections or malignant diseases.
- Sub 32. Interactive system according to ^{claim 1} ~~any of claims 1 to 18~~ for preparing an agent for the treatment of metabolic diseases, coagulation defects, viral, bacterial, mycotic or parasitic infections or malignant diseases.
- a 33. Method for the treatment of metabolic diseases, coagulation defects, viral, bacterial, mycotic or parasitic infections or malignant diseases comprising administering to the patient to be treated an interactive system according to ^{claim 1} ~~any of claims 1 to 18~~ in a suitable manner.